The Brain in Counseling

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Most of us would not categorize the emotional and relational challenges that lead us to seek counseling as physical challenges, and yet, our entire experience is mediated by our physical brains. That is why our mental health has so many physical components, like rest, nutrition, exercise, hormones, and even our social and physical development. A basic understanding of how the brain works aids us in several ways. First, knowing why we feel or behave a certain way helps us accept ourselves and our challenges. This alone can be a powerful tool in allowing us to find a path to greater health. Second, as we attempt to change, knowledge of the brain can guide us into where we place our efforts. Third, understanding what is happening within our own brains and the brains of others can mitigate the escalating drama in our relationships. This paper explains how the brain creates, impacts, and shapes the mind, and asks, "How does this guide what we do in counseling?"

For this investigation, we will borrow Paul Maclean's "Triune brain" (Maclean, 1988). This conceptualizes the brain as three distinct, interactive parts. In some ways, this model is metaphorical, as the three parts we are going to examine function as an inseparable whole, often influencing each other in unexpected ways (Steffen et al., 2022). That said, this simplified model is complex and accurate enough to help us grasp how our brain forms our mind. This "Mindsight" helps achieve well-being through an intentional pursuit of harmony between the competing concerns of these three systems, a process called integration (Siegel, 2010). If one of these systems is not functioning correctly, Mindsight can help us notice how it is malfunctioning and guide our pursuit of integration.

The Brainstem

The brainstem sits at the center base of our brains, connecting them to our bodies through the spinal cord (Siegel, 2010). It handles our bodies' automatic processes, such as the beating of the heart, breathing, and our energy levels. It regulates hunger, sexual desire, and sleepiness. If the temperature drops, this is the part of the brain that makes us shiver (Sapolsky, 2018). If we are injured, this part of the brain initiates a stress response. These automatic responses happen through our Autonomic Nervous System (ANS), which regulates both our resting systems, like sleep and digestion, and our fight or flight reactions (Cleveland Clinic, 2022). While these processes interact with our brain through the brainstem, they can also be understood to be body processes since the nerves that regulate them travel throughout our bodies and react automatically to our senses (Cozolino, 2006). Often, our reactions to situations and relationships are influenced by these unconscious appraisals of whether or not a situation is safe or dangerous (Porges, 1998). Polyvagel theory explains how this happens through three subsystems.

The 'Shutdown' System

The Dorsal Vagal Complex (DVC) evolved to respond to severe threats by immobilizing the body (Porges, 1998). This is why our bodies can freeze when under extreme stress. This system can slow your heart rate and breathing (von Holten, 2023), helping you to feign death in the face of extreme violence. It is important to remember that, whatever the evolutionary use of this system, it can activate in response to any severe stressor. This is why we can feel paralyzed when asked to do something frightening, like give a speech. When we are not in danger, this system regulates the body efficiently, promoting growth and restoration (Porges, 2008).

The 'Mobilization' System

The Sympathetic Nervous System (SNS) responds to threats by preparing us to fight or flee (Cozolino, 2006). It does this by increasing our heart rate, making us sweat, and inhibiting costly metabolic processes like digestion (Pordges, 1998). Intense emotion can activate this system, moving us to action, even when we are not in danger. For example, this system activates when playing sports or during the early stages of sexual arousal. Fear and anger can also cause this system to activate, which can motivate us to be defensive, cruel, or even violent. The pressure from these systems can be so great it can take our more conscious systems offline, resulting in actions that feel out of our control (Siegel, 2010).

The 'Social Engagement' System

Finally, the Ventral Vagal Complex (VVC) exerts a calming influence on our behavior, supporting sustained social contact (Cozolino, 2006). This system can inhibit defensive aggression when we are receiving distressed social cues, which reveals our nervous system is wired for cooperation and relationships, even when we are in the midst of conflict.

Clinical Application

Through our brainstem, our nervous system exerts strong forces on us throughout our body. We have little direct control over our immediate reactions to fear, anger, and other strong emotions. First, this gives us grounds to accept some of our past behavior. If we froze in the face of violence, we can stop calling it cowardice and recontextualize it as our body's natural attempt to survive something traumatic. Second, we can recognize our system's personal sensitivities. If the fear of a partner cheating activates our fight response, we can begin to consciously remove ourselves from situations that could result in aggression toward our partners or others. Third, we

can use our knowledge of our natural responses to begin the process of changing them— a process that will require understanding our more conscious systems.

The Limbic System

The limbic system makes up the lower core of our brains, where "it works closely with the brainstem and the body proper to create not only our basic drives but also our emotions" (Siegel, 2010, p.17). If you are feeling lonely, it can send signals to the brainstem to make you crave junk food (Sapolsky, 2018). This section of our brain is where we feel our emotions, which can move us toward or away from a person or experience (Siegel, 2010). Our emotional reactions can come from implicit memories stored in this section of the brain (Cozolino, 2006). While we may not be consciously aware of these memories, they can affect our bodily reactions. Consider learning to ride a bike: our brains do not consciously recall the day we learned, and yet we remember how to balance, pedal, etc. (Levine, 2010).

Much like the brainstem, everything that is happening in the limbic system is automatic (Sapolsky, 2018), although it can be influenced by what is happening in our conscious mind, which is the third system this paper discusses, the cortex. To understand these interactions, we will first examine a few of the limbic system's major structures.

The Amygdala

Our conscious awareness is too slow to effectively process fear, so the limbic system pairs stimuli with fear responses in the amygdala (Cozolino, 2006). It can activate our SNS, bypassing the process of determining if we are looking at a snake or a stick, and move us straight to leaping away (Sapolsky, 2018). It receives data directly from all our sensory inputs, and is particularly sensitive to pain, making it central to our experience of vigilance, anxiety,

uncertainty, and fear, but it also increases aggression and mediates feelings of disgust. The amygdala interfaces directly with our memory center, the hippocampus. This makes it so that we learn fear without consciously choosing to. We are actually primed to learn certain responses more easily than others, such as a fear or disgust of other races of people (Sapolsky, 2018). Racism is an unconsciously learned response. Lucky for us, we can unlearn these fears with the help of our conscious mind (Cozolino, 2006).

Hippocampus

Working alongside the amygdala and the cortex, the hippocampus "organizes explicit memory and conscious learning" (Cozolino, 2006, pp.52-53), encoding memories of spatial, semantic, and temporal information. This means that we have a system for remembering actual events that is separate from the systems telling our unconscious selves what those events may have meant. It is possible for a trigger, like a loud noise, to set off a chain of physiological reactions (eg. an immobilizing freeze response), without us being able to recall the source of the fear (Cozolino, 2006). This often happens when the hippocampus does not encode the memory, leaving only the implicit memory, which may surface as beliefs about similar events (Siegel, 2010). For example, if you are bitten by a dog when you are very young, you may not remember the bite, but you still may acquire a fear of dogs. Such a fear may feel irrational if you do not remember the source, and yet it proceeds from your physical history. It is a survival skill.

Hypothalamus

Another unconscious part of the limbic system, the Hypothalamus, translates our social interactions into physical reactions by mediating hormonal production and release (Cozolino, 2006). These hormones influence our sexual drives, but also our stress system. Cortisol helps our

body produce extra energy to face a stressful situation, but prolonged release (such as comes from chronic stress) can create long-term problems (Siegel, 2010). One way this creates challenges for our modern minds is that overwhelming or long-lasting stress (of the sort that often accompanies trauma) can permanently raise our cortisol levels, making our stress system more sensitive.

Clinical Application

When these systems are considered together, we see how many different ways our experiences can influence our emotional reactions in the present. If these reactions remain unexamined, they can contribute to our conscious beliefs and our sense of self. Take the example of an early dog-bite experience. Over time, an individual may come to believe they are just not a dog person, unaware that they have an implicit fear of dogs, and that seeing dogs activates discomfort in the amygdala, which in turn triggers a release of cortisol in the hypothalamus, resulting in a faster heart rate, sweating, and agitation. As with our nervous systems, understanding this lays a foundation for accepting ourselves and our experiences. Imagine being trained by abusive parents to fear personal flaws, like acne. Such a fear could result in an obsessive need to focus on skincare, while elevating stress in ways that could trigger it again! The sense of disgust may then reinforce negative beliefs about the self (eg. “I am ugly inside and out”).

While acceptance is a powerful starting point, how can we actually repair these systems? When first realizing how many of these reactions are outside of our control, it is natural to feel overwhelmed, hopeless, or even angry. It is important to remember that these systems are still learning. When we recall memories, those memories are subtly modified by the experience in

which they are recalled (Siegel, 2010). Therapy provides us a safe context to bring difficult memories back to the surface in safe ways, while also providing us opportunities to retrain these systems through experience, and exert conscious pressure on them to change. This pressure is the purview of the final system we're going to discuss: The cortex.

The Cortex

The outermost section of the brain, the cortex, decodes sensory information, comprehends language and mathematics, commands our muscles to move, and functions as the logical center where our decisions are made (Sapolsky, 2018). It is the part of your brain that is able to understand this paper, and, in Siegel's words (2010) "think about thinking" (p.19). The prefrontal cortex (PFC) is particularly important, connecting the cortex to the limbic system, where they stimulate or inhibit each other. So a craving for cookies can overcome the self-restraint needed for your diet, but a forceful decision to work out can overcome morning sleepiness (Cozolino, 2006). Another way to put it is, "the frontal cortex makes you do the right thing when it is the harder thing to do" (Sapolsky, 2018, p. 45). Broken down into smaller parts, the dorsolateral PFC (dlPFC) supplies rational, utilitarian thinking to the system (Sapolsky, 2018). This is actually the last part of the brain to mature, which could explain the massive influence of emotion on adolescents. Similarly, emotions influence this structure through the ventromedial PFC (vmPFC), which creates intuition and gut-feelings. While these systems can feel at odds, they are often complementary. If you were to hide a refugee from a violent government, the motivation to do so would be coming from the vmPFC, supplying you with emotional resolve, but the logical dlPFC would help you control that emotion while lying to an inspector at your door. Doing the harder thing requires both our emotional and logical selves.

While this system provides self-control, it is not free of the influence of our past. The quality of our natal experiences, our childhoods, the ways we have or have not used drugs, and the traumas we have experienced can all weaken our PFC's ability to exert control over our automatic reactions (Sapolsky, 2023). At times, even self-control is outside of our immediate control.

Clinical Application

The Cortex is central to the work of therapy. It can consciously retrain our automatic responses by reconsidering and recontextualizing them. This process is at the heart of what happens during talk therapy, especially in Cognitive Behavioral Therapy (Sapolsky, 2018). It allows us to recall memories, which can then be modified by the experience of recalling them (Siegel, 2010). For example, if we discuss a painful moment with a parent in a conversation that feels safe and nonjudgmental, that memory may be reencoded with less negative connotations. Our conscious effort can also allow us to safely expose ourselves to stressors, which can allow us to retrain our nervous system through more implicit means (Craske et al., 2015). We also have access to more abstract practices, such as mindfulness, meditation, and even exercise, which can help us stop our limbic system from inhibiting our PFCs, and minimize the automatic reactions of our nervous systems by promoting calm (Siegel, 2010). In essence, we can approach psychotherapy with a framework similar to physical therapy. Within the counseling room, we can recontextualize fears and memories, a process which can be painful and is best done with a skilled therapist helping us remain regulated. Outside of the therapy room, we can engage in exercises and mindful practices that can strengthen our self-control or weaken the power of our automatic systems. Together, the combinations of these practices provide a powerful foundation for returning us to health.

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